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The Control of CANADA THISTLE and SOW THISTLE in Alberta

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By G. R. STERLING

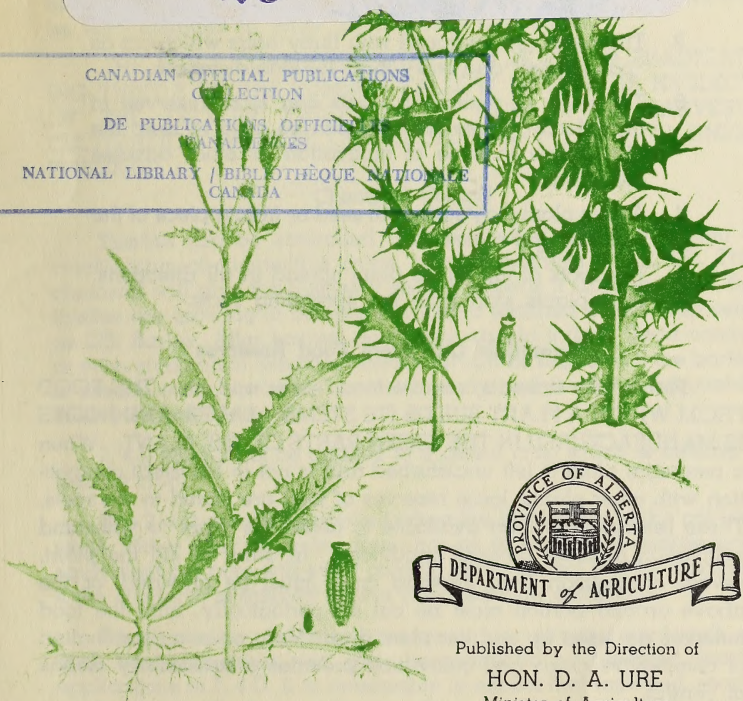
Supervisor, Soil Conservation and Weed Control

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The Control of Canada Thistle and Sow Thistle in Alberta

G. R. STERLING

Supervisor, Soil Conservation and Weed Control,
Field Crops Branch, Edmonton.

Canada thistle and sow thistle are increasing rapidly and are causing greater losses to agriculture in Alberta each year. These weeds can be controlled but many farmers have a great deal of difficulty in doing so.

Some of the reasons why they are hard to control may be listed as follows:

1. They are perennial weeds—this means they can grow year after year from the same roots.
2. The seeds are equipped with fluffy hairs which act as "parachutes" and carry them for long distances.
3. The roots of perennial plants can store reserves of plant food. These reserves can be used to keep the plant alive in spite of cultivation or other adverse conditions.
4. A new plant may start from seed or from a piece of the underground rootstock.
5. The roots of the thistle plant spread in all directions. New plants start from the spreading roots.

Perennials Can Store Food Reserves

Plants, like animals, require food, water and air. THE FOOD FROM WHICH A PLANT BUILDS ITS STEMS, LEAVES, AND ROOTS IS MANUFACTURED IN THE GREEN PARTS OF THE PLANT. When a perennial plant is left undisturbed and is not in too great competition with other plants, large reserves of food are stored in the roots. These reserves are then available to assist the plant to withstand cultivation or other adverse conditions. In order to kill the plant, severe competition from growing crops must be provided, or the above ground portion must be cut off periodically, until the food reserves are used up and the plant dies. Very often a combination of competitive crops and cultivation provides a satisfactory means of control.

Control By Competitive Crops and Cultivation

Thistles do not bloom until rather late in the season and the fact that the date of blooming can be delayed by competition from other plants offers another method of attack.

Methods of Control

While summer fallow for thistle control is dealt with in some detail in this pamphlet other methods are more economical and equally effective. In the past a great deal of publicity has been given the black fallow as a means of controlling weeds. It is costly, very destructive of soil fibre and encourages soil erosion. For these reasons we strongly advise readers of this pamphlet to consider carefully the use of competitive crops and combinations of cultivation and competitive crops in weed control. The use of such crops, especially in the moister areas, can eliminate not only the loss of a crop in the fallow year but also a great deal of costly cultivation. What is equally important is that the soil is kept covered, thus helping to prevent erosion.

Early Maturing Barley. preferably Olli Barley, if seeded early, at a heavy rate of seeding and fertilized will be ready to cut before many thistles go to seed. The barley should be cut "on the green side" and removed from the field as soon as possible. Cultivation should start immediately and continue until freeze-up. This method will eradicate most of the thistles. In severe infestations the above method could be used for two consecutive years.

Greenfeed can be used instead of barley and will work almost as well—seed it early, at a heavy rate of seeding and cut as the thistle comes into the bud stage.

Fall Rye. Two methods may be used. If moisture conditions are favourable for germination, the rye may be seeded after the removal of a crop of wheat, oats or barley. It should be seeded, however, not later than the first week in September.

A better method is to fallow the field until August 15th or September 1st and then seed to fall rye. Seed at least one and one-half bushels per acre. Harvest the rye as soon as it is ripe, and cultivate the land until freeze-up.

In severe infestations two consecutive crops of fall rye are advisable. DO NOT PASTURE FALL RYE WHICH IS BEING GROWN TO CONTROL WEEDS.

Forage Crops

Seeding infested land to a perennial hay crop is a practical and economical method of controlling Canada thistle and sow thistle. The choice of forage crops will depend largely on the part of the Province in which the problem arises. Generally speaking thistles are most troublesome in those districts which receive the greatest rainfall.

Alfalfa does well under the same conditions and is probably the most effective forage crop in controlling Canada thistle. Its effectiveness is due largely to the fact that it grows rapidly and is cut two or three times each season. Canada thistle is weakened greatly by repeated cuttings. The effectiveness of alfalfa in controlling weeds will be increased if a creeping rooted grass is added, this will fill in any blank spaces that may occur in seeding and will increase the competition of the forage crop. In the drier areas, crested wheat grass will control Canada thistle.

Grasses and legumes are also effective in controlling sow thistle but in this case a mixture of Alsike, Altaswede or White Dutch Clover, in combination with a grass is more effective than alfalfa. **DO NOT PASTURE FORAGE CROPS BEING USED FOR WEED CONTROL.**

Control by Fallow or Cultivation

Canada thistle and sow thistle come into bloom between the first week in July and early August depending upon the competition they have had from other plants or the general conditions under which they have grown. Experimental work has shown that the food reserves in the roots of thistles are lowest just as the plant comes into bloom. This is the weakest stage in the plant's life.

When thistles are to be killed by cultivation alone, however, it is often impossible to leave them until the bloom stage because of early maturing weeds in the field or because the heavy growth on the field would exhaust the soil moisture and make cultivation difficult. Where this is the case it is advisable to begin cultivation early in the season.

If the eradication programme is delayed until the plant is in the bloom stage it will be necessary to cut and burn the thistles where surface cultivation is to be used. Where the land is plowed, great care should be taken to completely bury all of the thistles, otherwise they will ripen and produce seed.

THOROUGH SURFACE CULTIVATION IS JUST AS EFFECTIVE AS PLOWING, the object being merely to eliminate the above ground growth.

To obtain a thorough job of cultivation, the implements used must be properly adjusted and the cutting edges must be sharp. With the duckfoot cultivator the shovels must be sharp and have sufficient overlap to cut off all the weeds. With the one-way the discs should be sharp and the machine properly adjusted. Sharp cutting edges are particularly important in loose ground. Dull edges will merely push the large weeds aside under loose soil conditions.

How Often Should The Land Be Cultivated?

It is essential that the new green growth produced by the plant is not left to grow long enough to enable it to produce food to store in the roots. For a few days after the first leaf appears above the ground the new plant is still drawing upon the reserves in the root DO NOT ALLOW THE NEW GROWTH TO REMAIN MORE THAN SIX OR SEVEN DAYS BEFORE CULTIVATING AGAIN. Cultivation should be very thorough in order to kill every new shoot.

THE MOST COMMON CAUSE OF FAILURE IN ERADICATING THISTLE BY THE SUMMER FALLOW METHOD IS NEGLECT OF THE FALLOW FIELD DURING AND AFTER HARVEST. CULTIVATION MUST BE CONTINUED RIGHT THROUGH UNTIL FREEZE-UP.

Chemical Control

Thistles can be controlled and eradicated easier by using a combination of competitive crops, cultural methods and 2, 4-D. This chemical will give the thistles a severe setback if applied when the thistles are growing in competition with a fertilized cereal crop such as Olli Barley. After harvest cultivation should follow. Good control or even eradication (weather permitting) can be expected if the barley is seeded early, sprayed, harvested early and the land thoroughly cultivated until freeze-up.

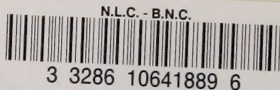
2, 4-D should not be applied to a cereal crop which is nursing a legume crop.

The 2, 4-D should be applied when the thistles are in the pre-bud stage. Either ester or amine formulations at rates of 6 ounces acid equivalent per acre will effect control. Better control will be obtained if the chemical is applied during good growing conditions.

Small patches of thistles growing on uncultivated land such as ditch banks, pastures, etc., may be controlled by repeated yearly applications of 2, 4-D. It is reasonable to expect that repeated yearly applications will effect eradication. Such patches may also be erad-

icated with sodium chlorate applied dry or in solution at rates from 1½ to 2 pounds per 100 sq. feet. When used in solution the 1½ to 2 pounds should be dissolved in a gallon of water, same to be applied to 100 sq. feet of weed growth. When using sodium chlorate, treatment should be made at least eight feet beyond the edge of the weed patch.

Precautions must be taken when using sodium chlorate as there is a definite fire hazard. Follow precautions as outlined on the label or write the Department of Agriculture, Edmonton, for printed precautions regarding sodium chlorate.



Crops such as the above are common but NOT profitable.

ACKNOWLEDGMENT

This circular was originally prepared by H. J. Mather, former Supervisor, Soil Conservation and Weed Control, Field Crops Branch, Alberta Department of Agriculture, Edmonton, now assistant to the Director, Line Elevator Farm Service, Winnipeg.